

Kramer Electronics, Ltd.



USER MANUAL

Model:

VS-3232D

32x32 Digital Matrix Switcher

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups¹ that are clearly defined by function.

Congratulations on purchasing your Kramer **VS-3232D** *32x32 Digital Matrix Switcher*. This product is ideal for the following typical applications:

- Professional display systems requiring video signal routing
- Broadcast, presentation and production facilities, as well as monitoring in large duplication systems
- Rental/staging applications

The package includes the following items:

- **VS-3232D** *32x32 Digital Matrix Switcher*
- Power cord
- Kramer **RC-IR3** infrared remote control transmitter (including the required batteries and a separate user manual²)
- This user manual²

Note: Throughout this user manual the chassis configuration is shown with 32 DVI inputs and 32 DVI outputs as a representation only. The following cards are available and may be mixed in the same chassis:

- DVI
- DVI dual link
- DVI (HDCP)
- DVI (over 4LC fiber optic cable)
- HDMI (HDCP)

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual

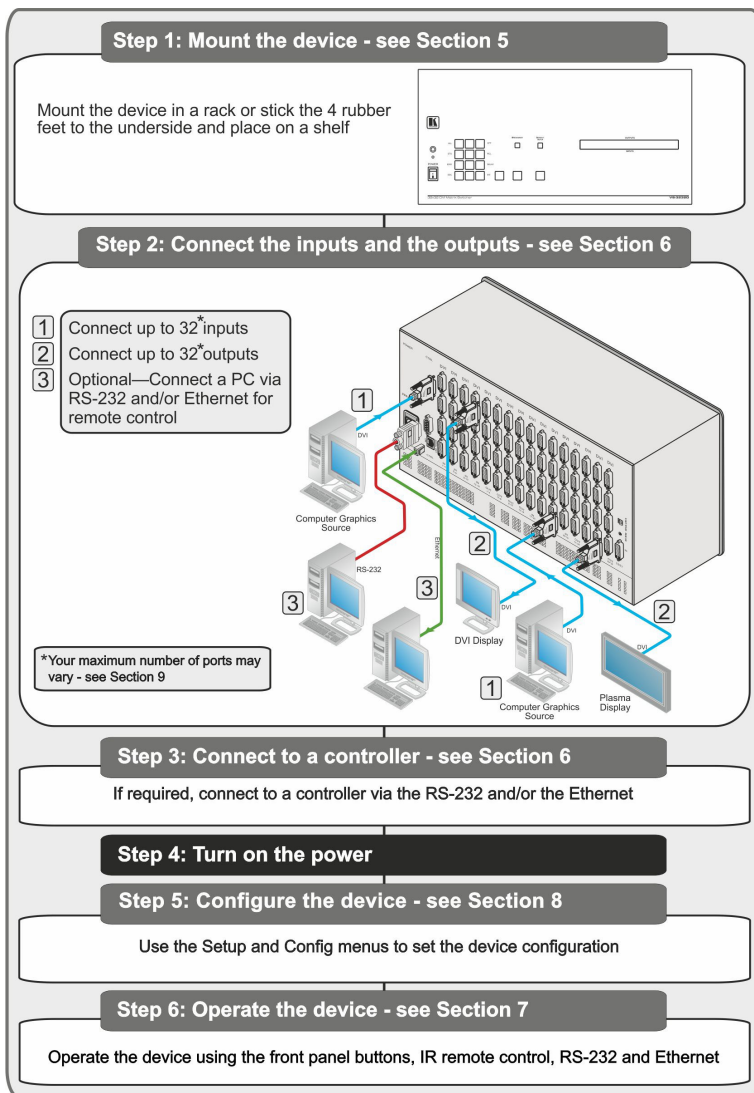
¹ GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

² Download up-to-date Kramer user manuals from <http://www.kramerelectronics.com>

- Use Kramer high-performance high-resolution cables¹
- Use only the power cord that is supplied with this machine

2.1 Quick Start

The following quick start chart summarizes the basic setup and operation steps.



¹ The complete list of Kramer cables is available from <http://www.kramerelectronics.com>

3 Overview

The Kramer **VS-3232D** is a high performance matrix switcher chassis that supports up to 32 x 32 ports¹ for various signals (depending on the type of cards installed). It features a very high bandwidth² of up to 3.2Gbps (for the chassis only, effective bandwidth of the system depends on the I/O cards) that ensures transparent performance even in the most critical applications. The cards re-clock and equalize the signals and the chassis can route any or all inputs to any or all outputs simultaneously.

The **VS-3232D** is highly configurable—you can add or remove inputs and outputs independently in groups of four and mix different types of input/output cards in the same chassis. For example, you can configure a device as a 4 x 24 or a 32 x 8 matrix switcher to exactly suit your needs.

The **VS-3232D** features:

- Full 32 x 32 non-blocking matrix array to switch any of the 32 input digital signals to any or all outputs (with limitations, see [Section 6](#))
- Easy access to 59 preset memory locations for quick access to user-defined setups
- The Kramer 2000 Protocol for serial control
- A 40 character by 2 line LCD that shows the operational status or the configuration menu
- A lock function to prevent tampering with the front panel
- A default EDID (Extended Display Identification Data) for each input
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling and processing algorithm ensures plug and play operation for DVI/HDMI systems
- Kramer Core™—flexible infrastructure conversion. Copper, fiber or Twisted Pair, all can be used at the same time according to input/output module selection. The matrix receives digital signals from compatible Kramer transmitters, automatically converts between available infrastructure options and sends the signals to compatible Kramer receivers
- Equalization and re-clocking on all card types

You can operate the **VS-3232D** via the front panel buttons³ or remotely via:

- RS-232 serial commands transmitted by a touch screen system, PC or other serial controller

¹ Can also be configured for other sizes (up to a maximum of 32 x 32)

² For maximum bandwidth supported by each type of card see the Technical Specifications in [Section 13](#)

³ The VS-3232D is a sophisticated device but has been designed to be as simple as possible to operate. Due to space limitations on the front panel 64 input/output selector buttons are instead substituted by a keypad. For details of how to route inputs to outputs, see [Section 7.2](#)

- Ethernet over a LAN
- The infrared remote control transmitter

The **VS-3232D** is housed in a 19" rack-mountable enclosure.

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VS-3232D** in a location free from moisture and away from excessive sunlight and dust

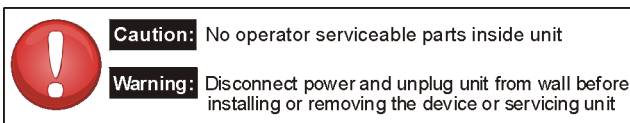
3.1 Defining EDID

The Extended Display Identification Data (EDID¹) is a data-structure provided by a display, to describe its capabilities to a graphics card (that is connected to the display's source). The EDID enables the video source to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

3.2 Recommendations for Best Performance

To achieve the best performance:

- Use only good quality connection cables to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **VS-3232D** away from moisture, excessive sunlight and dust



4 Defining the VS-3232D 32x32 Digital Matrix Switcher

[Figure 1](#), [Table 1](#), [Figure 2](#) and [Table 2](#) define the front panel of the **VS-3232D**.

¹ Defined by a standard published by the Video Electronics Standards Association (VESA)

Defining the VS-3232D 32x32 Digital Matrix Switcher

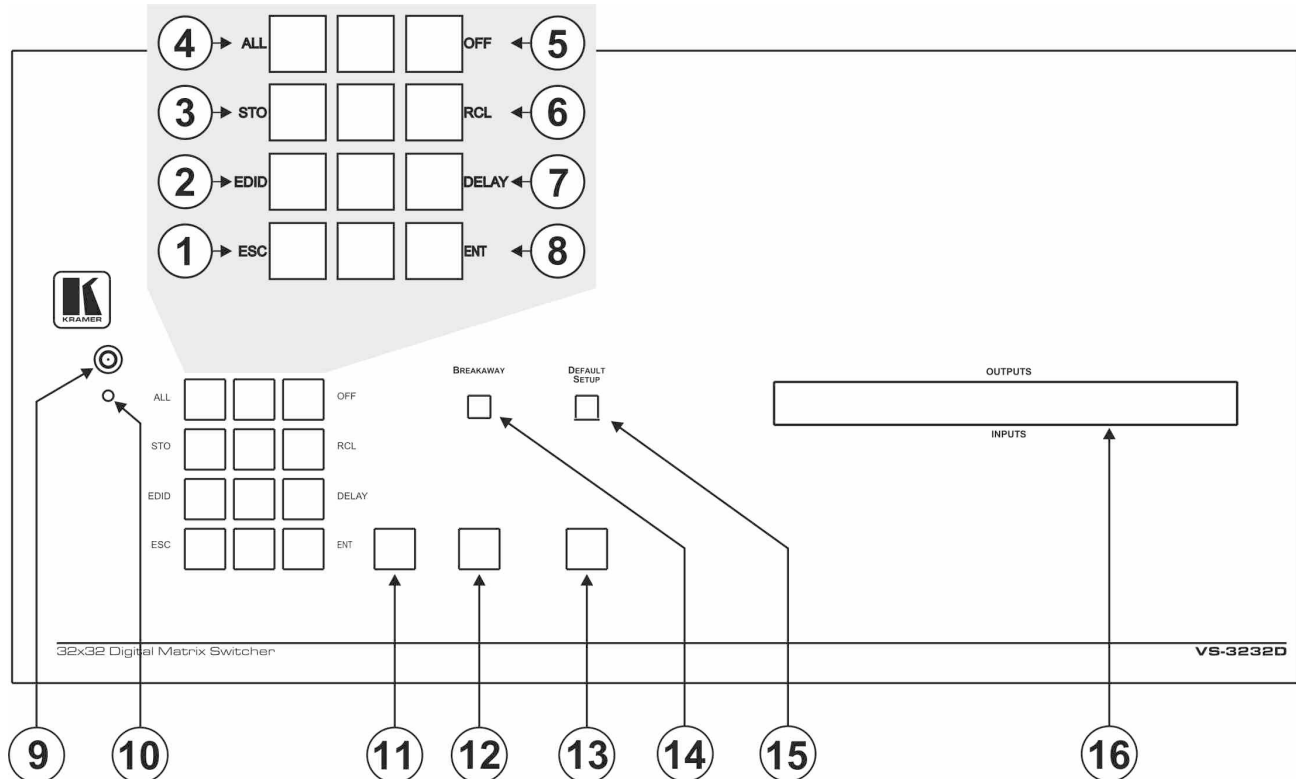


Figure 1: VS-3232D 32x32 Digital Matrix Switcher Front Panel

Note: Buttons 11, 12 and 13 function as the TAKE, MENU and LOCK buttons respectively

Table 1: VS-3232D 32x32 Digital Matrix Switcher Front Panel Features

#	Feature			Function
1	Double-function Selector Buttons Area	Menu Buttons	ESC	Press to exit the current operation
2			EDID	Press to assign EDID channels
3			STO ¹	Press to store the current setup in the a preset
4			ALL ¹	Press to connect an input to all outputs
5			OFF ¹	Press to turn off an output
6			RCL ¹	Press to recall a preset
7			DELAY	Press to set the delay between confirming an action and the execution of the action
8			ENT	Press to complete the input-output setup when using a one-digit number instead of two digits ² . Press to enter the options in a setup menu
9	IR Receiver			Infrared remote control sensor
10	IR LED			Lights yellow when receiving commands from the IR remote control transmitter
11	TAKE Button			Press to confirm actions (see Section 7.3.2)
12	MENU Button			Press once to enable the ALL, OFF STO and RCL buttons (see Section 8). Press again to enter the configuration menu (see Section 8.2). When in a Menu, press to cycle through the menu items
13	LOCK Button			Press and hold for approximately 2 sec to lock/unlock the front panel buttons (see Section 7.5)
14	BREAKAWAY Button			Press to exit a Menu (see Section 8)
15	DEFAULT SETUP Button			Press to recall the default setup (see Section 7.4.5)
16	OUTPUTS/INPUTS LCD Display			Displays the outputs (upper row) switched to the selected inputs (lower row), (see Section 7.1). Displays user interface messages and menus



Figure 2: VS-3232D Front Panel Numeric Keypad

Table 2: VS-3232D Front Panel Numeric Keypad Labels

#	Feature	Function
17	◀ (Backward)	Press to shift the sliding window to the right ³
18	1, 2, 3, 4, 5, 6, 7, 8, 9, 0	Numeric keypad, 1 to 0
19	▶ (Forward)	Press to shift the sliding window to the left ³

1 After pressing the MENU button, this button lights and is enabled

2 For example, to enter input 5, you can either press 05 or 5, ENT

3 Since the LCD display is large enough to show only 13 cross-points out of a total of 32

[Figure 3](#) and [Table 3](#) define the rear panel of the **VS-3232D** showing DVI cards installed as an example.

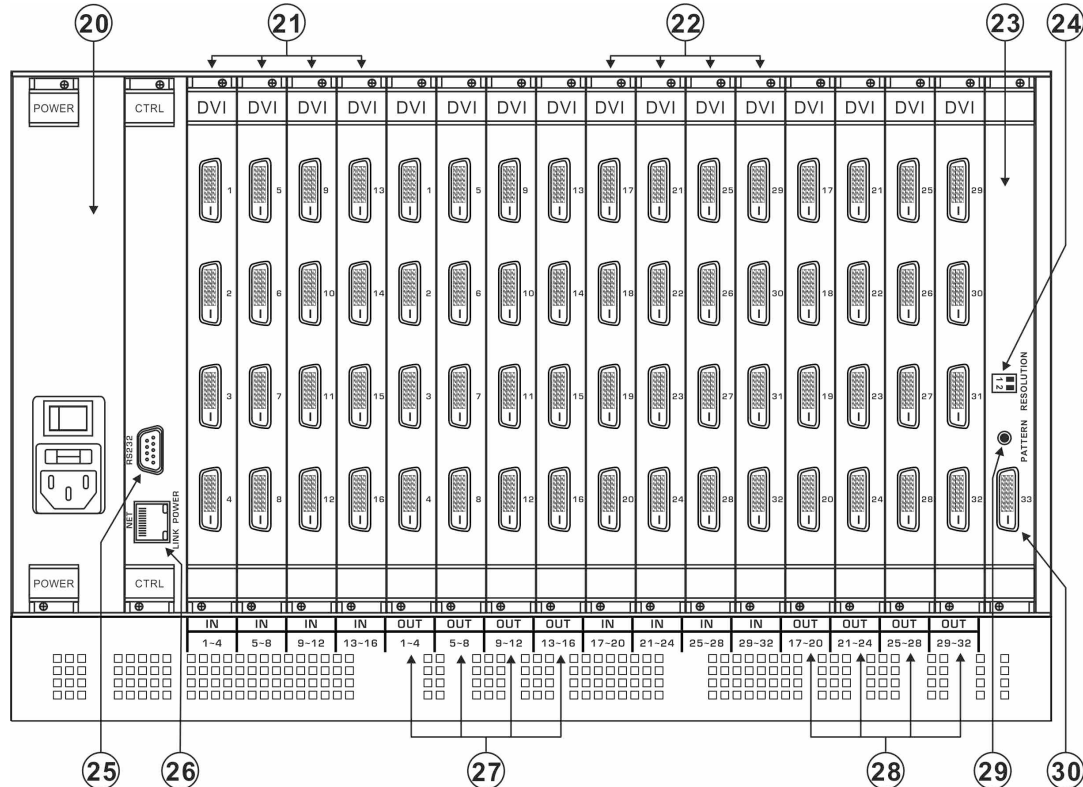


Figure 3: VS-3232D 32x32 Digital Matrix Switcher Rear Panel Showing DVI Cards

Table 3: VS-3232D 32x32 Digital Matrix Switcher Rear Panel Features

#	Feature		Function
20	AC Mains Power Module		Fuse holder and power cord socket. Connect to the AC mains supply
21	IN 1~16 Connectors	INPUTS	Connect to the relevant video sources, depending on the cards installed (1 to 16, see Section 6)
22	IN 17~32 Connectors		Connect to the relevant video sources, depending on the cards installed (17 to 32, see Section 6)
23	TEST Module		Signal generator module for testing video outputs (see Section 10)
24	RESOLUTION DIP-switches		Set the resolution for video generated by the Test module (see Section 10.2)
25	RS-232 9-pin D-sub Port		Connects to the remote operation PC or remote controller (see Section 6.1)
26	NET Ethernet RJ-45 Connector		Connect to a PC or controller via the Ethernet LAN (see Section 6.3). The <i>LINK</i> LED flashes when communication is active. <i>POWER</i> LED lights when the interface receives power
27	OUT 1~16 Connectors	OUTPUTS	Connect to the relevant video acceptors, depending on the cards installed (1 to 16, see Section 6)
28	OUT 17~32 Connectors		Connect to the relevant video acceptors, depending on the cards installed (17 to 32, see Section 6)
29	PATTERN Button		Press the button repeatedly to change the video pattern generated by the Test module (see Section 10.3)
30	Test Module Output Connector		Connect to one of the relevant video inputs to aid in troubleshooting (see Section 10.4)

4.1 Using the IR Transmitter

You can use the **RC-IR3** IR transmitter to control the machine via the built-in IR receiver on the front panel.

5 Installing the VS-3232D in a Rack

This section provides instruction on rack mounting the **VS-3232D**.

Before Installing in a Rack

Before installing in a rack, be sure that the environment is within the recommended range:

OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing



CAUTION!

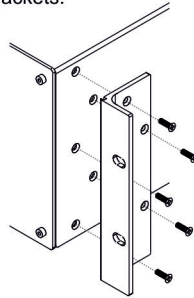
When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (5 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from: <http://www.kramerelectronics.com>)

6 Connecting the VS-3232D 32x32 Digital Matrix Switcher

The configuration of DVI input/output cards shown in [Figure 4](#) is merely a sample representation and different I/O cards may be mixed as required (for limitations, see [page 11](#)). Exactly the same principles apply to installations using other card types.

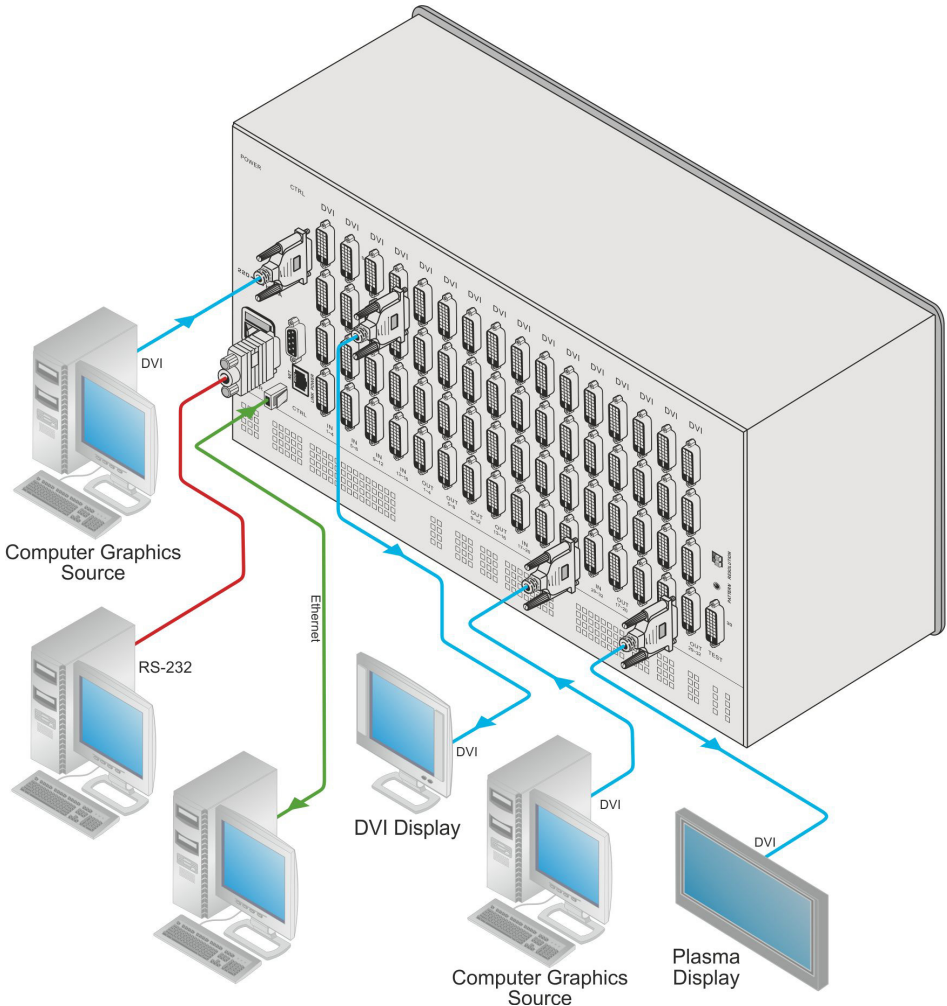


Figure 4: Connecting the VS-3232D

To install¹ the VS-3232D as illustrated in the example in [Figure 4](#):

1. Connect up to 32 DVI video sources (for example², computer graphics sources).
2. Connect up to 32 DVI video acceptors, (for example², a plasma display and a DVI LCD display).
3. If required, connect a PC or remote controller to the RS-232 port (see [Section 6.1](#)) and/or the Ethernet port (see [Section 6.3](#)).
4. Connect the power cord³.
5. If necessary, review and set the system configuration using the Menu (see [Section 8](#)).

Note: Given an input signal that is HDCP encoded, the **VS-3232D** will output a signal only if the output port to which it is switched support HDCP.

6.1 Port Numbering

On all cards apart from the DVI dual link cards, there are four physical ports and the numbering of ports is sequential from top to bottom and left to right. Each DVI dual link card provides two physical ports which causes the loss of two numbers in the numbering sequence of that card only. A sample numbering is shown in [Figure 5](#) and explained in [Table 4](#).

¹ Switch off the power for each device before connecting it to your VS-3232D

² In this example only two inputs and two outputs are connected

³ We recommend that you use only the power cord that is supplied with the device (not shown in [Figure 4](#))

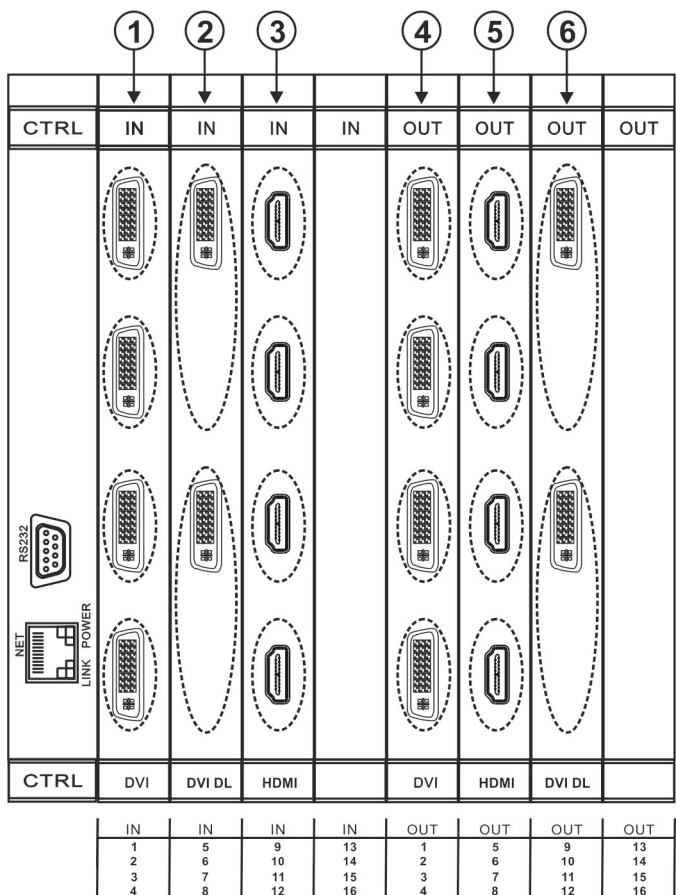


Table 5: EDID Configuration Requests and Results

EDID Request	EDID Sent
From OUT 11	Blank (256 bytes of 0xFF)
From IN 13	None (error message displayed)

6.2 Connecting to the VS-3232D via RS-232

You can connect to the **VS-3232D** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required¹.

To connect to the VS-3232D via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **VS-3232D** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC

6.3 Connecting to the VS-3232D via Ethernet

You can connect the **VS-3232D** via Ethernet using a crossover cable (see [Section 6.3.1](#)) for direct connection to the PC, or a straight through cable (see [Section 6.3.2](#)) for connection via a network hub or network router².

6.3.1 Connecting the Ethernet Port directly to a PC

You can connect the Ethernet port on the **VS-3232D** to the Ethernet port on your PC via a crossover cable with RJ-45 connectors.

This type of connection is recommended for identification of the factory default IP Address of the **VS-3232D** during the initial configuration

To configure your PC after connecting the Ethernet port:

1. Right-click the **My Network Places** icon on your desktop.
2. Select **Properties**.
3. Right-click **Local Area Connection Properties**.
4. Select **Properties**.
The **Local Area Connection Properties** window appears.
5. Select the **Internet Protocol (TCP/IP)** and click the **Properties** Button.

¹ Note that some early devices require a null modem

² After connecting the Ethernet port, you have to install and configure your Ethernet Port. For detailed instructions, see the Ethernet Configuration Guide (Lantronix) in the technical support section on our Web site <http://www.kramerelectronics.com>

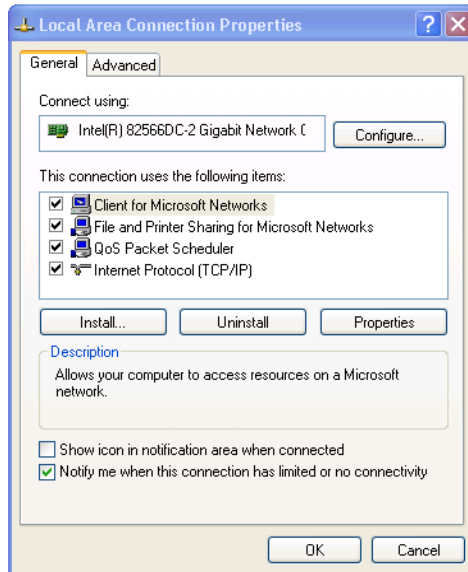


Figure 6: Local Area Connection Properties Window

6. Select **Use the following IP Address** and enter the details as shown in [Figure 7](#).

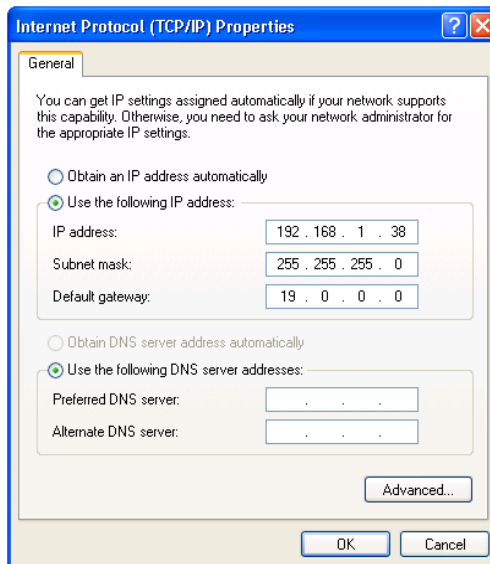


Figure 7: Internet Protocol (TCP/IP) Properties Window

7. Click **OK**.

6.3.2 Connecting to the Ethernet Port via a Network Switch/Hub

To connect to the Ethernet port on the VS-3232D via a network switch/hub:

- Connect the PC to the Ethernet network switch/hub using a straight through cable

7 Operating Your Video Matrix Switcher

This section describes:

- The startup display (see [Section 7.1](#))
- Using the selector buttons (see [Section 7.2](#))
- Confirming actions (see [Section 7.3](#))
- Switching options (see [Section 7.4](#))
- Locking the front panel (see [Section 7.5](#))

7.1 Startup Display

After switching on the power, the LCD display¹ shows the following screens in sequence.

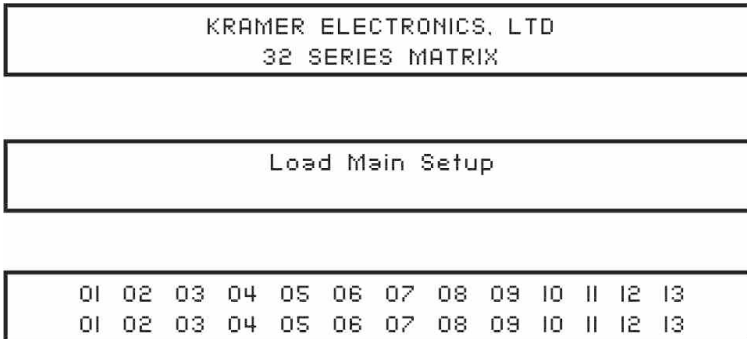


Figure 8: Default Startup Status Display Sequence

The front panel of the **VS-3232D** includes a numeric keypad within the selector buttons area². This keypad lets you enter both the output and input numbers as well as various numeric configuration values (see [Section 7.2](#)).

When the unit is powered-on, the last matrix setup that was used is loaded. Use either the recall setup³ (see [Section 8.1.6](#)) or default setup recall⁴ (see [Section 7.4.5](#)) functions to retrieve other setups.

¹ The text in the LCD Display may vary (according to machine settings)

² See [Table 1](#)

³ Records a stored configuration from a preset

⁴ For quick retrieval, you can program a default setup that is commonly used

7.1.1 Viewing the Display

[Figure 8](#) shows the output-input matrix on the LCD display. The LCD display can show 13 out of the 32 available matrix combinations at once. To view any of the matrix combinations use the ◀ or the ▶ buttons on the front panel to shift the sliding window to the right or left.

This sliding window functionality is enabled when:

- The switcher is in between operations¹
- Recalling a setup using the ◀ or ▶ buttons

When entering an output/input combination, the contents of the LCD display automatically shift to indicate the current status of the selected output.

7.2 Using the Selector Buttons

For numbers between 1 and 9, the **VS-3232D** can handle two digit numbers as well as single digit numbers. When entering a single digit number (for example 5), you can either press 0 followed by 5, or 5 followed by ENT.

Pressing 00 (or 0, ENT) is only relevant for an input selection and is used to disconnect the currently entered output number from the input.

For example, the following display indicates that inputs 8 and 12 are disconnected from any output (note that in the second line representing these inputs the display is blank):

```

06 07 08 09 10 11 12 13
12 08      10 14 13 06
    
```

The ESC button is used to cancel an operation without affecting the current status. For example, if you enter an incorrect number by mistake, press the ESC button to cancel the operation.

Note: At any stage, if no button is pressed within approximately 15 seconds, the automatic timeout causes the **VS-3232D** to exit the operation and revert to the output/input display.

7.3 Confirming Actions

You can choose to work in the At Once (default²) or the Confirm mode.

In the At Once mode:

- The TAKE button does not light
- Pressing an OUT-IN combination implements the switch without further user confirmation

¹ Waiting for its next operation while all previous operations are complete or cancelled

² For all actions except storing/recalling

- You save time as execution is immediate and actions require no user confirmation
- No protection is offered to correct an erroneous action

In the Confirm mode:

- The TAKE button lights
- You enter an action and then confirm it by pressing the TAKE button
- Every action requires user confirmation, protecting against erroneous actions
- Execution is postponed until you confirm the action¹

7.3.1 Toggling between the At Once and Confirm Modes

To toggle between the At Once and Confirm modes:

Note: If the TAKE button is flashing you cannot toggle between the At Once and Confirm modes. A flashing TAKE button indicates that an action is currently pending confirmation.

1. Press TAKE to toggle between the At Once mode and the Confirm mode. The TAKE button lights and actions now require user confirmation.
2. Press the lit TAKE button to toggle from the Confirm mode back to the At Once mode. The TAKE button is no longer lit and actions no longer require user confirmation.

7.3.2 Confirming a Switching Action

Actions only require confirmation when the device is in the Confirm mode.

To confirm a switching action:

1. Using the numeric keypad, enter an output-input combination. The TAKE button flashes.
2. Press the flashing TAKE button to confirm the action. The action is confirmed and the TAKE button lights.

7.4 Switching Actions

This section describes how to:

- Switch one input to one output (see [Section 7.4.1](#))
- Switch several inputs to several outputs (see [Section 7.4.2](#))
- Turn off several outputs (see [Section 7.4.3](#))

¹ Failure to press the TAKE button within a few seconds results in the action timing out automatically

7.4.1 Switching one Input to one Output

To switch one input to one output:

1. Using the numeric keypad, enter the required output (in this example, 12).
The following is displayed:

06 07 08 09 10 11 12 13

In__ => Out 12

The left-hand side of the display shows a section of the output/input display automatically sliding the content to include output 12.

2. Using the numeric keypad, enter the required input (in this example, 14):
 - In the At Once mode, the switching takes place immediately and the LCD display shows a segment of the input-output status that includes the switched input and output (for example, 14-12)
In the Confirm mode, the LCD display shows the following:
In 14 => Out 12
Incomplete actions time out after approximately 15 seconds.
 - In the Confirm mode, press the flashing TAKE button to switch the input to the output

7.4.2 Switching Several Inputs to Several Outputs

If you want to switch several inputs to several outputs simultaneously you must be in the Confirm mode.

In the Confirm mode you can enter a batch of several actions and then confirm the batch by pressing TAKE once (simultaneously switching several output-input combinations).

To switch several inputs to several outputs in the Confirm mode:

1. Using the numeric keypad, enter an output-input combination.
The TAKE button flashes.
2. Enter additional output-input combinations.
The LCD display can show up to five pending actions (although the batch is not limited to five actions)¹:
09 => 06 05 => 07
3. After entering all output/input combinations, press the flashing TAKE button to confirm the actions.
The inputs switch to the respective outputs as shown on the LCD display and the TAKE LED is lit.

7.4.3 Turning an Output Off

Turning an output off means that there is no input switched to this output. This is indicated on the display by the Input being blank underneath the relevant Output.

¹ In this example, input 9 is set to switch to output 6 and input 5 is set to switch to output 7

To turn an output off:

1. Press MENU.
The Menu buttons light and are enabled.
2. Press OFF (3) on the numeric keypad (see [Figure 2](#)).
The following message is displayed:
out__ => OFF
3. Use the numeric keypad to turn the required output off.
The output is turned off.

To turn an output off in the Confirm mode:

- Repeat the steps above and then press the flashing TAKE button to confirm the action

Alternatively, you can perform a switching operation (see [Section 7.4.1](#)) and set the input to 00.

7.4.4 Turning Off Several Outputs

To turn off several outputs in the Confirm mode, repeat the switching actions described in [Section 7.4.2](#) but set the inputs to 00.

7.4.5 Recalling the Default Setup

You can store a commonly used setup as the default setup (see [Section 8.2.6](#)) which can be recalled at any time.

Note: This is not the setup that is loaded when the unit is turned on. When the unit is turned on, the setup that was last used before the unit was turned off is loaded.

To recall the default setup:

1. Press DEFAULT SETUP.
The DEFAULT SETUP button flashes and the following message is displayed:
recall DEFAULT setup
press FLASHING button to confirm
2. Press DEFAULT SETUP.
The following message is displayed:
all Setups and Connections change
press TAKE to confirm
 - The TAKE button flashes.
3. Press TAKE.
The default setup is recalled and the display reverts to the output-input display.

7.5 Locking the Front Panel Buttons

You can lock¹ the **VS-3232D** to prevent tampering with the unit or prevent the settings from being changed accidentally via the front panel buttons.

To lock the front panel buttons:

- Press and hold LOCK until the button lights.
The front panel buttons are locked

To unlock the front panel buttons:

- Press and hold LOCK until the button is no longer lit.
The front panel buttons are unlocked

8 Using the Configuration Menus

The configuration menus let you configure the **VS-3232D** to best suit your needs. There are two configuration menus:

- Setup Menu—those that are accessed on a regular basis (for example, storing setups and setting the delay), see [Section 8.1](#)
- Config Menu—those that are accessed only occasionally (for example, setting the interface or communication protocol), see [Section 8.2](#)

The following rules apply to the menu operation:

- If no selection is made within approximately 15 seconds, the operation times-out and the display reverts to the output/input display
- At any point in the Menu, press ESC to move up one level or press BREAKAWAY to exit the Menu altogether
- At any point in the Menu, only buttons that are active light or flash
- All of the procedures in this section assume that you are starting the procedure from the standard, operational output/input display

8.1 Using the Setup Menu

The Setup Menu provides access to settings that are regularly changed and comprises the following options:

- **1: inXX=>ALL**, switching one input to all outputs (see [Section 8.1.1](#))
- **3: outXX=OFF**, turning off an output (see [Section 8.1.2](#))
- **7: EDID**, assignment to an output (see [Section 8.1.3](#))
- **9: Delay** setting for an output (see [Section 8.1.4](#))
- **4: store setup XX**, storing the setup in a preset (see [Section 8.1.5](#))
- **6: recall setup XX**, recalling a preset (see [Section 8.1.6](#))

¹ You can still remotely operate via RS-232 or Ethernet even when the front panel is locked

8.1.1 Setup Menu—1: inXX=>ALL, Switching one Input to all Outputs

This option switches one input to all outputs.

To switch one input to all outputs:

1. Press MENU.
The Setup Menu options are displayed.
2. Press 1 (ALL) on the numeric keypad (see [Figure 2](#)).
The following is displayed:

```
in__ => ALL
```
3. Using the numeric keys, enter the input to be switched to all outputs.
The TAKE button flashes.
4. Press TAKE.
The selected input is switched to all outputs.
The display reverts to the output/input display showing that the selected input is switched to all outputs.

8.1.2 Setup Menu—3: outXX=>OFF, Turning an Output Off

This option turns an output off.

To turn an output off:

1. Press MENU.
The Setup Menu options are displayed.
2. Press 3 (OFF) on the numeric keypad (see [Figure 2](#)).
The following is displayed:

```
out__ => OFF
```
3. Using the numeric keys, enter the output to be turned off.
The TAKE button flashes.
4. Press TAKE.
The selected output is turned off.
The display reverts to the output/input display showing that the selected output is turned off with the input being blank.

8.1.3 Setup Menu—7: EDID, Assignment to an Input

This option assigns an EDID to between one and eight inputs. More than eight EDID assignments must be assigned in separate batches of eight.

Each input on the **VS-3232D** has a factory default EDID loaded (see [Section 15](#)). The EDID for each input can be changed independently via the menu (described below) or by uploading an EDID binary file to each input via the RS-232 port using Kramer EDID Sender software¹.

¹ Available for download from <http://www.kramerelectronics.com>

To assign an EDID to between one and eight inputs:

1. Press MENU.
The Setup Menu options are displayed.
2. Press 7 (EDID) on the numeric keypad (see [Figure 2](#)).
The following is displayed:

```
SETUP EDID
ENTER to View EDID and Set EDID
```
3. Press ENT.
The current EDID matrix configuration is displayed.
4. Using the numeric keys, enter the input in which to store the EDID (in this example, 08), and enter the output (in this example, 05) from which to read the EDID.
The following is displayed:

```
00 01 02 03 04 05 06 07 08
                                05   out05 => in08
```

The TAKE button flashes.

5. Repeat Step 4 for up to eight inputs.
6. Press TAKE.
The EDID is stored and passed through to the input.
The display reverts to the output/input display.
7. Repeat the above steps for the next batch of eight EDID assignments.

To view the EDID assignments:

1. Press MENU.
The Setup Menu options are displayed.
2. Press 7 (EDID) on the numeric keypad (see [Figure 2](#)).
The following is displayed:

```
SETUP EDID
ENTER to View EDID and Set EDID
```
3. Press ENT.
The current EDID matrix configuration is displayed. In this example, input 07 is assigned to output 05, all other EDID values are default.

```
05 06 07 08 09 10
05
```

8.1.4 Setup Menu—9: Delay, Setting for an Output

Some displays require a delay in the negotiation of data between the display and the switcher for reliable negotiation of data between them. This option sets the time delay for an output which lapses between entering a switching action and the execution of the action. This delay can be set for each output independently. The delay is defined in units of 200ms and ranges from 0 to 15, providing delays of between 0 and 3 seconds (15 x 200ms = 3 seconds).

To set the execution delay for an output:

1. Press MENU.
The Setup Menu options are displayed.
2. Press 9 (DELAY) on the numeric keypad (see [Figure 2](#)).
The output/delay times display is shown.
3. Using the numeric keys, enter the output (in this example, 03).
The following is displayed:

```
01 02 03 04 05 06 07 08
```

DLY__ =>out03
4. Using the numeric keys, enter the number of delay units.
5. Press TAKE.
The selected output delay is set.
The display reverts to the output/input display.

8.1.5 Setup Menu—4: store setup XX, Storing the Setup in a Preset

This option stores the current setup in a preset (1 to 59).

To store the current setup in a preset:

1. Press MENU.
The Setup Menu options are displayed.
2. Press 4 (STO) on the numeric keypad (see [Figure 2](#)).
The following is displayed:

```
store => __
```
3. Using the numeric keys, enter the preset (1 to 59) in which to store the current setup.
The following is displayed:

```
Wait ....
```

After a few seconds, if the preset is not empty, the following is displayed:

```
SETUP NOT EMPTY
```

```
CONFIRM
```

The TAKE button flashes.
4. Press TAKE.
The setup is stored in the selected preset for subsequent recall.
The display reverts to the output/input display.

8.1.6 Setup Menu—6: recall setup XX, Recalling a Preset

This option recalls a stored configuration from a preset (1 to 59).

To recall a stored configuration:

1. Press MENU.
The Setup Menu options are displayed.

2. Press 6 (RCL) on the numeric keypad (see [Figure 2](#)).
The following is displayed:
`recall <= ____`
3. Using the numeric keys, enter the preset (in this example, 02) to recall.
The following is displayed:
`Wait`
After a few seconds, the following is displayed on the right hand side:
`CONFIRM`
`RECALL <= 02`
The TAKE button flashes.
4. Press TAKE.
The preset is recalled.
The display reverts to the output/input display.

8.2 Using the Config Menu

The Config Menu provides access to configuration settings that are not regularly changed and comprises the following options:

- Input signal detection ([Section 8.2.1](#))
- Output load detection ([Section 8.2.2](#))
- Interface configuration ([Section 8.2.3](#))
- Interface Reply configuration ([Section 8.2.4](#))
- Protocol configuration ([Section 8.2.5](#))
- Storing the default setup ([Section 8.2.6](#))
- Resetting the **VS-3232D** ([Section 8.2.7](#))
- Firmware revision display ([Section 8.2.8](#))

To enter the Config Menu press MENU twice. The MENU button lights and the following message is displayed:

- Start configuration menu
- MENU to view setups ENT to change them

When browsing through the configuration menu, enabled buttons light or flash.

Use the Config Menu as follows:

1. Press the MENU button to cycle through the menu items¹.
2. Press the ENT button to enter a submenu.
3. After entering a submenu, you can select between several options.
Select an option by pressing one of the illuminated buttons in the Selector Buttons area.
4. After selecting the desired option, a description of the desired change is displayed and the TAKE button flashes.

¹ The LCD display shows the current status of the selected menu item

5. Press the flashing TAKE button to confirm the change.
A description of the current state is displayed for about one second. The unit automatically switches to the next item in the menu.

8.2.1 Config Menu—Input Signal Detection Display

This option displays a list of inputs and indicates on which of them signals have been detected.

To display a list of inputs that have detected signals:

1. Press MENU twice.
The following message is displayed:

```
start configuration menu
MENU to view setup ENT to change them
```
2. Press MENU.
The following is displayed:

```
IN:   01 02 03 04 05 06 07 08 09 10 11
SIG:  Y  X  Y  Y  Y  Y  X  Y  Y  Y  X
```

 - Y indicates that a signal is detected and X indicates that no signal is detected on the relevant input.
3. Do one of the following:
 - Press BREAKAWAY to exit the Config Menu
 - Wait approximately 15 seconds for the operation to time out
 - Press MENU to move to the next Config Menu option

8.2.2 Config Menu—Output Load Detection Display

This option displays a list of outputs and indicates which have loads attached to them.

To display a list of outputs and attached loads:

1. Press MENU twice.
The following message is displayed:

```
start configuration menu
MENU to view setup ENT to change them
```
2. Press MENU until the following is displayed:

```
OUT:   01 02 03 04 05 06 07 08 09 10 11
LOAD:  Y  X  Y  Y  Y  Y  X  Y  Y  Y  X
```

 - Y indicates that a load is attached and X indicates that no load is detected on the relevant output.
3. Do one of the following:
 - Press BREAKAWAY to exit the Config Menu
 - Wait approximately 15 seconds for the operation to time out
 - Press MENU to move to the next Config Menu option

8.2.3 Config Menu—Interface Configuration

This option lets you activate or deactivate the IR (infrared) and Ethernet interfaces.

To activate or deactivate the IR or Ethernet interfaces:

1. Press MENU twice.

The following message is displayed:

```
start configuration menu
MENU to view setup ENT to change them
```

2. Press MENU until the following is displayed:

```
INTERFACE configuration
current:IR-ON      Ethernet-OFF
```

The current status of the IR and Ethernet interfaces is displayed.

3. Press ENT to select the Interface Submenu.
4. Select 1 to modify the status of the IR interface or 2 to modify that status of the Ethernet interface (in this example, 2).

The following is displayed:

```
Ethernet interface setup
1:make it ACTIVE      2:turn it OFF
```

5. Press 1 to activate the interface or 2 to deactivate it.

6. Press TAKE to confirm the action.

The interface status is changed. After a few seconds the next option on the Config Menu is displayed.

8.2.4 Config Menu—Interface Reply Configuration

This option lets you switch the Reply configuration on or off. Setting Reply to on causes all interfaces that are set to on to accept and execute commands, and also to reply. Setting Reply to off causes all interfaces that are set to on to accept and execute commands, but not to reply.

To switch the Reply configuration on or off:

1. Press MENU twice.

The following message is displayed:

```
start configuration menu
MENU to view setup ENT to change them
```

2. Press MENU until the following is displayed:

```
interface REPLY configuration
current interface REPLY - ON
```

This indicates the current Reply configuration status.

3. Press ENT to enter the Reply Submenu.

The following is displayed:

```
interface REPLY configuration
1:turn REPLY ON      2:never REPLY
```

4. Press 1 to switch Reply on or 2 to switch it off.
5. Press TAKE to confirm the action.
A message is displayed indicating the new status of the Reply configuration.
After a few seconds the next option on the Config Menu is displayed.

8.2.5 Config Menu—Protocol Configuration

The **VS-3232D** supports Kramer Protocol 2000. There are currently no options to modify.

8.2.6 Config Menu—Store Default Setup

This option lets you store the current setup as the default setup. The default setup can be recalled at any time using the DEFAULT SETUP button (see [Section 7.4.5](#)).

Note: This is not the setup that is loaded when the unit is switched on.

To store the current setup as the default setup:

1. Press MENU twice.
The following message is displayed:

```
start configuration menu
MENU to view setup ENT to change them
```
2. Press MENU until the following is displayed:

```
store DEFAULT setup
press ENTER to store
```
3. Press ENT to store the current configuration as the default configuration.
The following is displayed:

```
current matrix stage is OKAY?
press TAKE to confirm
```
4. Press TAKE.
The following is displayed:

```
current matrix stage
store as DEFAULT setup
```

 - This indicates that the current setup is stored as the default setup. After a few seconds the next option on the Config Menu is displayed.

8.2.7 Config Menu—Total Matrix Reset

This option lets you turn all outputs off or reset the unit to its factory default settings.

To reset the matrix setup:

1. Press MENU twice.
The following message is displayed:

```
start configuration menu
MENU to view setup ENT to change them
```

2. Press MENU until the following is displayed:

TOTAL MATRIX RESET

exit = ESC ENT = submenu

3. Press ENT to enter the Reset Submenu.

The following is displayed:

COMPLETELY MATRIX RESET

1:ALL outputs OFF 2:Factory default

4. Press 1 to turn off all outputs or 2 to perform a factory reset of all options.

Caution: Selecting option 2 to perform a factory default reset clears all setups, options and configuration.

5. Press TAKE and wait a few seconds.

The following is displayed:

Are you Absolutely sure !!!

Once more TAKE to confirm

6. Press TAKE.

The following is displayed:

Matrix erased!!!

Please, wait ...

The matrix and device configuration are erased. After a few seconds the next option on the Config Menu is displayed.

8.2.8 Config Menu—Display Firmware Versions

This option displays the main and front firmware versions.

To display the firmware versions:

1. Press MENU twice.

The following message is displayed:

start configuration menu

MENU to view setup ENT to change them

2. Press MENU until the following is displayed:

Main Firmware Version: 1.0

Front Firmware Version: 1.0

3. Either:

- Press BREAKAWAY to exit the Config Menu
- Wait approximately 15 seconds for the operation to time out

9 Configuring the Number of Installed Input and Output Ports

After installing or removing a module you need to set the number of input and output ports so that the **VS-3232D** recognizes the new configuration. Refer to [Section 6.1](#) for an explanation of port numbering before setting the number of input and output ports.

To set the number of input or output ports:

1. Press ESC, ENT and LOCK together.
The following is displayed:

Configuration Device

2. Press ENT.
The following is displayed:

Test Board: 0 MaxInput:32 MaxOutput:32

Note: The number of input and output ports can only be set in units of four, for example, 4 x 4, 32 x 4 or 12 x 16, and not 5 x 4 or 12 x 17.

3. Using the numeric keys, enter the number of input and output ports installed.
The TAKE button flashes.
4. Press TAKE.
The number of installed ports is saved and the display reverts to the output/input display.
5. Reboot the device by turning the power off and then on again.

10 Installing and Using the Test Module to Troubleshoot Video Problems

The **VS-3232D** includes a test module which acts as a signal generator and can be used to diagnose video/audio issues in an operating environment.

The test module must be installed in the configuration before it can be used. When installing the test module, the number of configured inputs and outputs must be increased by one. For example:

- If your **VS-3232D** has four inputs and eight outputs, you must configure the **VS-3232D** as 5 x 9
- If your **VS-3232D** has 32 inputs and 32 outputs, you must configure the **VS-3232D** as 33 x 33

10.1 Installing the Test Module

To install the test module in the configuration:

1. Press ESC, ENT and LOCK together.
The following is displayed:

Configuration Device

2. Press ENT.
The following is displayed:
Test Board: 0 MaxInput:32 MaxOutput:32
where 0 indicates that the test module is not installed.
3. Using the numeric keys, press 1 to indicate that the test module is installed.
The TAKE button flashes.
4. Press TAKE.
5. Increase the number of configured inputs and outputs by one (see [Section 9](#)).
The test module is now installed and may be used.

10.2 Setting the Resolution of the Generated Video

The test module generates a range of both PC and HD resolutions which are selected by a combination of DIP-switches and an on-board jumper (labeled **Audio**). Install the jumper to select HD resolutions or remove the jumper to select PC resolutions.

The Resolution DIP-switch is used to set the resolution of the generated video as listed in [Table 6](#) and [Table 7](#).

Table 6: Available PC Resolutions for Generated Video (Jumper off)

DIP-switch Position		Resolution
1	2	
OFF	OFF	1024 x 768 @60Hz
ON	OFF	1280 x 1024 @60Hz
OFF	ON	1600 x 1200 @60Hz
ON	ON	1920 x 1200 @60Hz (default)

Table 7: Available HDResolutions for Generated Video (Jumper on, default)

DIP-switch Position		Resolution
1	2	
OFF	OFF	480p
ON	OFF	720p
OFF	ON	1080i
ON	ON	1080p

[Figure 9](#) shows the Resolution DIP-switch with both switches off (up, default, 480p).



Figure 9: Resolution DIP-switch

10.3 Setting the Pattern of the Generated Video

The Pattern button is used to set the pattern of generated video. There are 32 available patterns. Press the button repeatedly to cycle through the patterns.

10.4 Using the Test Module to Troubleshoot Video Problems

The test module may be used in various ways to isolate video problems.

The following examples are based on the signal paths shown in [Figure 10](#) and a **VS-3232D** device installed as follows:

- 32 inputs and 32 outputs
- The test module is installed and configured (see [Section 10.1](#))
- 33 configured inputs and 33 configured outputs (see [Section 9](#))

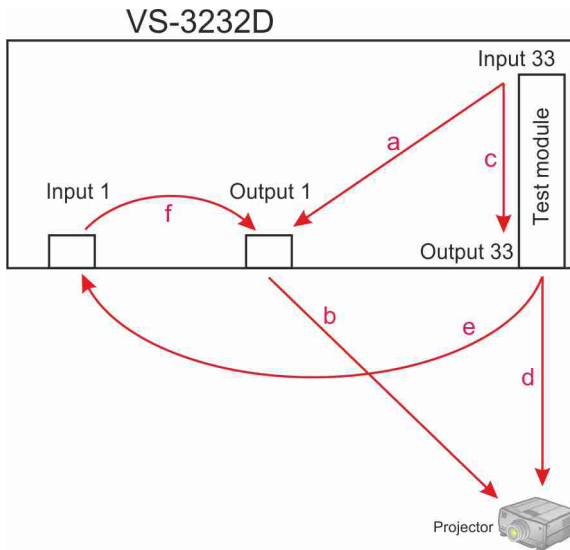


Figure 10: Signal Paths for Isolating problems

10.4.1 Testing the Projector Output

Signal path: c to d; d to projector

To test the projector output:

1. Configure Input 33 to Output 33 (see [Section 7.4](#)).
2. Connect Output 33 to the projector.
3. Set the generated video resolution (see [Section 10.2](#)).
4. Set the pattern for the generated video (see [Section 10.3](#)).
5. Verify that the projector output is as expected.

10.4.2 Testing the Output Signal Path to the Projector

Signal path: a to b; b to projector

To test the output signal path to the projector:

1. Configure Input 33 to Output 1 (see [Section 7.4](#)).
2. Connect Output 1 to the projector.
3. Set the generated video resolution (see [Section 10.2](#)).
4. Set the pattern for the generated video (see [Section 10.3](#)).
5. Verify that the projector output is as expected.

10.4.3 Testing the Input and Output Signal Path to the Projector

Signal path: c to e; e to f; f to b; b to projector

To test the input and output signal path to the projector:

1. Configure Input 33 to Output 33 (see [Section 7.4](#)).
2. Connect Output 33 to Input 1.
3. Configure Input 1 to Output 1.
4. Connect Output 1 to the projector.
5. Set the generated video resolution (see [Section 10.2](#)).
6. Set the pattern for the generated video (see [Section 10.3](#)).
7. Verify that the projector output is as expected.

11 I/O Card Hardware Installation Instructions

The **VS-3232D** I/O cards mount in one of the 16 slots on the rear of the **VS-3232D** chassis. Slots are numbered from left to right and must be filled consecutively from left to right, **without leaving empty slots**.

WARNING: An input card must only be mounted in a slot designated for input cards (slots IN 1 to 16 and IN 17 to 32) and an output card must only be mounted in a slot designated for output cards (slots OUT 1 to 16 and OUT 17 to 32).

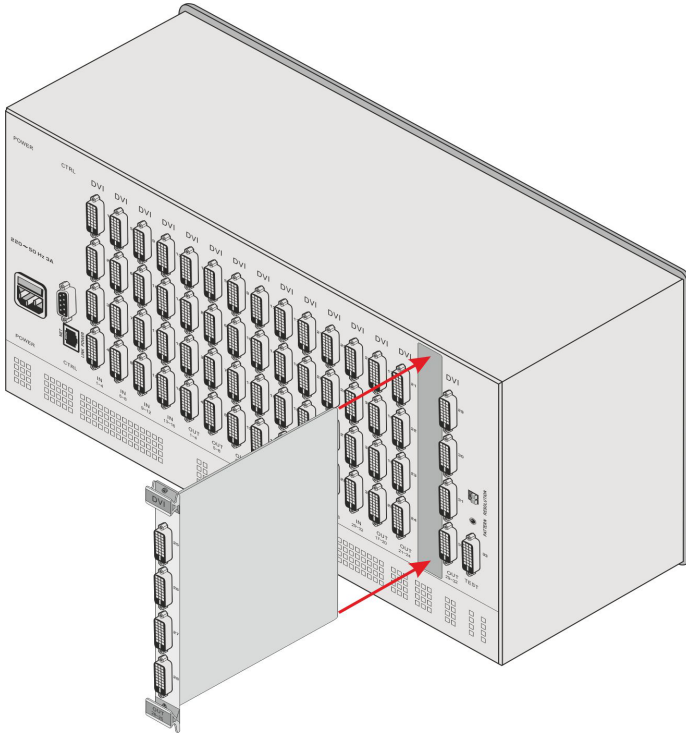


Figure 11: Inserting the Card into a Slot

To install an I/O card as shown in [Figure 11](#):

1. Power off the **VS-3232D** and all devices connected to it.
2. Using a Phillips screwdriver, loosen the screws at the top and bottom of the blanking plate.
3. Remove the blanking plate from the slot and store it for possible future use.
4. Remove the new card from its shipping box and anti-ESD bag.
5. Holding the card by the upper and lower handle, align the card with the plastic guide rails (see [Figure 12](#)).

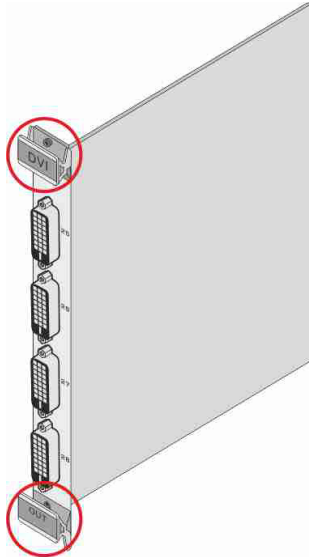


Figure 12: Card Handles

6. Slide the card into the chassis until the front of the card makes contact with the connector inside the chassis.
7. Press the card firmly into the slot until the connector plate is flush with the rear panel of the chassis and the connector is fully seated.
8. Using a Phillips screwdriver, tighten the retaining screws at the top and bottom of the card to secure it to the chassis.
9. Power on the **VS-3232D** and follow the procedure to configure the new card (see [Section 9](#)).
10. Power on the peripheral devices.

12 Upgrading the VS-3232D Firmware

Upgrading the firmware on the **VS-3232D** can be done only by authorized service personnel.

13 Technical Specifications

[Table 8](#) lists the technical specifications of the **VS-3232D**.

Table 8: Technical Specifications of the 32x32 Digital Matrix Switcher

BANDWIDTH:	Supports up to 3.2Gbps bandwidth per channel (limited by the card installed)
MAX RESOLUTION:	Up to UXGA; 1080p
CONTROLS:	Front panel buttons, Infrared remote control transmitter, RS-232, Ethernet
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	19" x 14.2" x 6U (W, D, H) rack-mountable
POWER SOURCE:	100-240V AC, 50/60Hz, 220VA
WEIGHT:	13.0kg (28.7lbs) approx
ACCESSORIES:	Power cord, Infrared remote control transmitter

[Table 9](#) lists the technical specifications of the cards that are compatible with the **VS-3232D** chassis.

Table 9: Technical Specifications of VS-3232D Compatible Cards

MAX RESOLUTION: Up to UXGA; 1080p, 1920x1200					
Card	DVI	DVI Dual Channel	DVI (HDCP)	HDMI	DVI (over 4LC fiber cable) ¹
Ports	4 DVI: 1.2Vpp on DVI Molex 24-pin (F) connectors; DDC signal 5Vpp (TTL)	2 DVI: 1.2Vpp on DVI Molex 24-pin (F) connectors; DDC signal 5Vpp (TTL)	4 DVI (HDCP): 1.2Vpp on DVI Molex 24-pin (F) connectors; DDC signal 5Vpp (TTL)	4 HDMI	4 x 4 LC Connectors
Bandwidth per Channel	1.65Gbps	3.3Gbps	2.25Gbps	2.25Gbps	1.65Gbps
Compliance	DVI 1.0		HDCP/HDMI		DVI 1.0
HDMI Support			V.1.4 with Deep Color, x.v.Color™		
3D Pass Through			Yes	Yes	
Features	Kramer Equalization & re-Klocking™ Technology				
HDTV Compatible	Yes				

¹ Multi-mode glass fiber cables with LC connections must be used, such as the Kramer C-4LC/4LC

14 Default Communication Parameters

[Table 10](#) lists the default communication parameters for the **VS-3232D**.

Table 10: Default Communication Parameters for the VS-3232D

EDID	
EDID data is passed between Output 1 and Input 1	
RS-232	
Protocol 2000	
Baud Rate:	9600
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	HEX
Example (To switch Output 1 to Input 1):	0x01, 0x81, 0x81, 0x81
Ethernet	
Default Values	Reset Settings
IP Address: 192.168.1.39	Power cycle the unit while holding in the Factory Reset button located on the rear panel of the unit
TCP Port #: 5000	
UDP Port #: 50000	

15 Factory Default EDID

15.1 DVI Input Card

```

Monitor
Model name..... VS-16DVIS
Manufacturer..... KRM
Plug and Play ID..... KRM0200
Serial number..... 1
Manufacture date..... 2006, ISO week 12
-----
EDID revision..... 1.3
Input signal type..... Digital (DVI)
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 700 x 390 mm (31.5 in)
Power management..... Not supported
Extension blocs..... None
-----
DDC/CI..... n/a

Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0.640 - Ry 0.341
Green chromaticity..... Gx 0.286 - Gy 0.610
Blue chromaticity..... Bx 0.146 - By 0.069
White point (default).... Wx 0.284 - Wy 0.293
Additional descriptors... None

Timing characteristics
Horizontal scan range.... 31-94kHz
Vertical scan range..... 50-85Hz
Video bandwidth..... 170MHz
CVT standard..... Not supported
GTF standard..... Not supported
Additional descriptors... None

```


Preferred timing..... Yes
 Native/preferred timing.. 1280x768p at 60Hz (4:3)
 Modeline..... "1280x768" 79.500 1280 1344 1472 1664 768 771 778 798 +hsync +vsync
 Detailed timing #1..... 1920x1200p at 60Hz (16:10)
 Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

Standard timings supported
 720 x 400p at 70Hz - IBM VGA
 720 x 400p at 88Hz - IBM XGA2
 640 x 480p at 60Hz - IBM VGA
 640 x 480p at 67Hz - Apple Mac II
 640 x 480p at 72Hz - VESA
 640 x 480p at 75Hz - VESA
 800 x 600p at 56Hz - VESA
 800 x 600p at 60Hz - VESA
 800 x 600p at 72Hz - VESA
 800 x 600p at 75Hz - VESA
 832 x 624p at 75Hz - Apple Mac II
 1024 x 768i at 87Hz - IBM
 1024 x 768p at 60Hz - VESA
 1024 x 768p at 70Hz - VESA
 1024 x 768p at 75Hz - VESA
 1280 x 1024p at 75Hz - VESA
 1152 x 870p at 75Hz - Apple Mac II
 1360 x 765p at 60Hz - VESA STD
 1280 x 800p at 60Hz - VESA STD
 1440 x 900p at 60Hz - VESA STD
 1280 x 960p at 60Hz - VESA STD
 1280 x 1024p at 60Hz - VESA STD
 1400 x 1050p at 60Hz - VESA STD
 1680 x 1050p at 60Hz - VESA STD
 1600 x 1200p at 60Hz - VESA STD

Report information
 Date generated..... 12-Dec-10
 Software revision..... 2.53.0.861
 Data source..... File
 Operating system..... 5.1.2600.2.Service Pack 3

Raw data
 00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,11,48,4B,FF,FF,80,
 8B,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,0E,1F,00,80,51,00,1E,30,40,80,37,00,6F,13,11,00,00,1E,28,3C,80,A0,
 70,B0,23,40,30,20,36,00,06,44,21,00,00,1A,00,00,00,FC,00,56,53,2D,33,32,44,56,49,53,0A,20,20,20,00,00,
 00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,20,00,39

15.2 DVI (HDCP) Input Card

Monitor
 Model name..... VS-16HDCP
 Manufacturer..... KRM
 Plug and Play ID..... KRM0200
 Serial number..... 1
 Manufacture date..... 2010, ISO week 24

 EDID revision..... 1.3
 Input signal type..... Digital (DVI)
 Color bit depth..... Undefined
 Display type..... RGB color
 Screen size..... 700 x 390 mm (31.5 in)
 Power management..... Not supported
 Extension blocs..... 1 (CEA-EXT)

 DDC/CI..... n/a

Color characteristics
 Default color space..... Non-sRGB
 Display gamma..... 2.20
 Red chromaticity..... Rx 0.640 - Ry 0.341
 Green chromaticity..... Gx 0.286 - Gy 0.610
 Blue chromaticity..... Bx 0.146 - By 0.069
 White point (default).... Wx 0.284 - Wy 0.293
 Additional descriptors... None

Timing characteristics

Horizontal scan range..... 31-94kHz
Vertical scan range..... 50-85Hz
Video bandwidth..... 170MHz
CVT standard..... Not supported
GTF standard..... Not supported
Additional descriptors... None
Preferred timing..... Yes
Native/preferred timing... 1920x1080p at 60Hz (16:9)
Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
Detailed timing #1..... 1920x1200p at 60Hz (16:10)
Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

Standard timings supported

720 x 400p at 70Hz - IBM VGA
720 x 400p at 88Hz - IBM XGA2
640 x 480p at 60Hz - IBM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 720p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information

Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Not supported
YCbCr 4:2:2..... Not supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
Modeline..... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
Modeline..... "1920x1080" 74.250 1920 2448 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16:9)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16:9)
Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

CE video identifiers (VICs) - timing/formats supported

720 x 576p at 50Hz - EDTV (4:3, 16:15)
1280 x 720p at 50Hz - HDTV (16:9, 1:1)
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
1920 x 1080i at 50Hz - HDTV (16:9, 1:1)
1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
1920 x 1080p at 50Hz - HDTV (16:9, 1:1)
NB: NTSC refresh rate = (Hz*1000)/1001

CE audio data (formats supported)

LPCM 3-channel, 24-bits at 44/48 kHz

CE speaker allocation data

Channel configuration.... 3.0
 Front left/right..... Yes
 Front LFE..... No
 Front center..... Yes
 Rear left/right..... No
 Rear center..... No
 Front left/right center... No
 Rear left/right center... No
 Rear LFE..... No

CE vendor specific data (VSDB)
 IEEE registration number. 0x000C03
 CEC physical address..... 1.0.0.0
 Maximum TMDS clock..... 165MHz

Report information
 Date generated..... 22-May-11
 Software revision..... 2.53.0.861
 Data source..... File
 Operating system..... 5. 1.2600.2.Service Pack 3

Raw data
 00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,18,14,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
 11,48,4B,FF,FF,80,81,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,02,3A,80,18,71,38,2D,40,58,2C,
 45,00,C4,8E,21,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,06,44,21,00,00,1A,00,00,00,FC,00,56,
 53,2D,33,32,48,44,43,50,0A,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,01,F9,
 02,03,1A,41,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
 2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
 80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
 00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,C0

15.3 HDMI Input Card

Monitor
 Model name..... VS-16HDCP
 Manufacturer..... KRM
 Plug and Play ID..... KRM0200
 Serial number..... 1
 Manufacture date..... 2006, ISO week 12

 EDID revision..... 1.3
 Input signal type..... Digital (DVI)
 Color bit depth..... Undefined
 Display type..... RGB color
 Screen size..... 700 x 390 mm (31.5 in)
 Power management..... Not supported
 Extension blocs..... 1 (CEA-EXT)

 DDC/CI..... n/a

Color characteristics
 Default color space..... Non-sRGB
 Display gamma..... 2.20
 Red chromaticity..... Rx 0.640 - Ry 0.341
 Green chromaticity..... Gx 0.286 - Gy 0.610
 Blue chromaticity..... Bx 0.146 - By 0.069
 White point (default).... Wx 0.284 - Wy 0.293
 Additional descriptors... None

Timing characteristics
 Horizontal scan range.... 31-94kHz
 Vertical scan range..... 50-85Hz
 Video bandwidth..... 170MHz
 CVT standard..... Not supported
 GTF standard..... Not supported
 Additional descriptors... None
 Preferred timing..... Yes
 Native/preferred timing.. 1280x768p at 60Hz (4:3)
 Modeline..... "1280x768" 79.500 1280 1344 1472 1664 768 771 778 798 +hsync +vsync
 Detailed timing #1..... 1920x1200p at 60Hz (16:10)
 Modeline..... "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync -vsync

Standard timings supported

720 x 400p at 70Hz - IBM VGA
720 x 400p at 88Hz - IBM XGA2
640 x 480p at 60Hz - IBM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1360 x 765p at 60Hz - VESA STD
1280 x 800p at 60Hz - VESA STD
1440 x 900p at 60Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
1280 x 1024p at 60Hz - VESA STD
1400 x 1050p at 60Hz - VESA STD
1680 x 1050p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD

EIA/CEA-861 Information

Revision number..... 3
IT underscan..... Not supported
Basic audio..... Supported
YCbCr 4:4:4..... Not supported
YCbCr 4:2:2..... Not supported
Native formats..... 1
Detailed timing #1..... 720x480p at 60Hz (4:3)
 Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:9)
 Modeline..... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3..... 1920x1080i at 50Hz (16:9)
 Modeline..... "1920x1080" 74.250 1920 2048 2492 2640 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #4..... 1280x720p at 60Hz (16:9)
 Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #5..... 1280x720p at 50Hz (16:9)
 Modeline..... "1280x720" 74.250 1280 1720 1760 1980 720 725 730 750 +hsync +vsync

CE video identifiers (VICs) - timing/formats supported

720 x 576p at 50Hz - EDTV (4:3, 16:15)
1280 x 720p at 50Hz - HDTV (16:9, 1:1)
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
1920 x 1080i at 50Hz - HDTV (16:9, 1:1)
1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
1920 x 1080p at 50Hz - HDTV (16:9, 1:1)
NB: NTSC refresh rate = (Hz*1000)/1001

CE audio data (formats supported)

LPCM 3-channel, 24-bits at 44/48 kHz

CE speaker allocation data

Channel configuration.... 3.0
Front left/right..... Yes
Front LFE..... No
Front center..... Yes
Rear left/right..... No
Rear center..... No
Front left/right center... No
Rear left/right center... No
Rear LFE..... No

CE vendor specific data (VSDb)

IEEE registration number. 0x000C03
CEC physical address.... 1.0.0.0

Maximum TMDS clock..... 165MHz

Report information

Date generated..... 25-Jul-11
Software revision..... 2.53.0.861
Data source..... File
Operating system..... 5.1.2600.2.Service Pack 3

Raw data

00,FF,FF,FF,FF,FF,FF,00,2E,4D,00,02,01,00,00,00,0C,10,01,03,81,46,27,78,0A,D5,7C,A3,57,49,9C,25,
11,48,4B,FF,FF,80,8B,C0,81,00,95,00,81,40,81,80,90,40,B3,00,A9,40,0E,1F,00,80,51,01,1E,30,40,80,
37,00,6F,13,11,00,00,1E,28,3C,80,A0,70,B0,23,40,30,20,36,00,06,44,21,00,00,1A,00,00,00,FC,00,56,
53,2D,31,36,48,44,43,50,0A,20,20,20,00,00,00,FD,00,32,55,1F,5E,11,00,0A,20,20,20,20,20,01,4D,
02,03,1A,41,47,11,13,05,14,84,10,1F,23,0A,06,04,83,05,00,00,65,03,0C,00,10,00,8C,0A,D0,8A,20,E0,
2D,10,10,3E,96,00,58,C2,21,00,00,18,01,1D,80,18,71,1C,16,20,58,2C,25,00,C4,8E,21,00,00,9E,01,1D,
80,D0,72,1C,16,20,10,2C,25,80,C4,8E,21,00,00,9E,01,1D,00,72,51,D0,1E,20,6E,28,55,00,C4,8E,21,00,
00,1E,01,1D,00,BC,52,D0,1E,20,B8,28,55,40,C4,8E,21,00,00,1E,00,00,00,00,00,00,00,00,00,00,C0

Model name..... VS-16HDCP

Manufacturer..... KRM

Plug and Play ID..... KRM0200

Serial number..... 1

Manufacture date..... 2010, ISO week 24

15.4 DVI Dual Channel Input Card

Not yet available

16 Communication Protocols

Tables of HEX Codes for Serial Communication (Protocol 2000)

[Table 11](#) lists the Protocol 2000¹ hex codes for switching inputs 1 to 32 to outputs 1 to 16.

Table 11: Hex Table (IN 1-32 to OUT 1-16)

	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16
IN 1	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 2	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 3	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 4	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 5	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 6	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81

¹ Full details are available on our Web site at <http://www.kramerelectronics.com>

Communication Protocols

	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16
IN 7	01 87 81	01 87 82 81	01 87 83 81	01 87 84 81	01 87 85 81	01 87 86 81	01 87 87 81	01 87 88 81	01 87 87 81	01 87 8A 81	01 87 8B 81	01 87 8C 81	01 87 8D 81	01 87 8E 81	01 87 8F 81	01 87 90 81
IN 8	01 88 81	01 88 82 81	01 88 83 81	01 88 84 81	01 88 85 81	01 88 86 81	01 88 87 81	01 88 88 81	01 88 88 81	01 88 8A 81	01 88 8B 81	01 88 8C 81	01 88 8D 81	01 88 8E 81	01 88 8F 81	01 88 90 81
IN 9	01 89 81	01 89 82 81	01 89 83 81	01 89 84 81	01 89 85 81	01 89 86 81	01 89 87 81	01 89 88 81	01 89 89 81	01 89 8A 81	01 89 8B 81	01 89 8C 81	01 89 8D 81	01 89 8E 81	01 89 8F 81	01 89 90 81
IN 10	01 8A 81	01 8A 82 81	01 8A 83 81	01 8A 84 81	01 8A 85 81	01 8A 86 81	01 8A 87 81	01 8A 88 81	01 8A 8A 81	01 8A 8A 81	01 8A 8B 81	01 8A 8C 81	01 8A 8D 81	01 8A 8E 81	01 8A 8F 81	01 8A 90 81
IN 11	01 8B 81	01 8B 82 81	01 8B 83 81	01 8B 84 81	01 8B 85 81	01 8B 86 81	01 8B 87 81	01 8B 88 81	01 8B 8B 81	01 8B 8B 81	01 8B 8B 81	01 8B 8C 81	01 8B 8D 81	01 8B 8E 81	01 8B 8F 81	01 8B 90 81
IN 12	01 8C 81	01 8C 82 81	01 8C 83 81	01 8C 84 81	01 8C 85 81	01 8C 86 81	01 8C 87 81	01 8C 88 81	01 8C 8C 81	01 8C 8C 81	01 8C 8C 81	01 8C 8C 81	01 8C 8C 81	01 8C 8C 81	01 8C 8C 81	01 8C 8C 81
IN 13	01 8D 81	01 8D 82 81	01 8D 83 81	01 8D 84 81	01 8D 85 81	01 8D 86 81	01 8D 87 81	01 8D 88 81	01 8D 8D 81	01 8D 8D 81	01 8D 8D 81	01 8D 8D 81	01 8D 8D 81	01 8D 8D 81	01 8D 8D 81	01 8D 8D 81
IN 14	01 8E 81	01 8E 82 81	01 8E 83 81	01 8E 84 81	01 8E 85 81	01 8E 86 81	01 8E 87 81	01 8E 88 81	01 8E 8E 81	01 8E 8E 81	01 8E 8E 81	01 8E 8E 81	01 8E 8E 81	01 8E 8E 81	01 8E 8E 81	01 8E 8E 81
IN 15	01 8F 81	01 8F 82 81	01 8F 83 81	01 8F 84 81	01 8F 85 81	01 8F 86 81	01 8F 87 81	01 8F 88 81	01 8F 8F 81	01 8F 8F 81	01 8F 8F 81	01 8F 8F 81	01 8F 8F 81	01 8F 8F 81	01 8F 8F 81	01 8F 8F 81
IN 16	01 90 81	01 90 82 81	01 90 83 81	01 90 84 81	01 90 85 81	01 90 86 81	01 90 87 81	01 90 88 81	01 90 90 81	01 90 90 81	01 90 90 81	01 90 90 81	01 90 90 81	01 90 90 81	01 90 90 81	01 90 90 81
IN 17	01 91 81	01 91 82 81	01 91 83 81	01 91 84 81	01 91 85 81	01 91 86 81	01 91 87 81	01 91 88 81	01 91 91 81	01 91 91 81	01 91 91 81	01 91 91 81	01 91 91 81	01 91 91 81	01 91 91 81	01 91 91 81
IN 18	01 92 81	01 92 82 81	01 92 83 81	01 92 84 81	01 92 85 81	01 92 86 81	01 92 87 81	01 92 88 81	01 92 92 81	01 92 92 81	01 92 92 81	01 92 92 81	01 92 92 81	01 92 92 81	01 92 92 81	01 92 92 81
IN 19	01 93 81	01 93 82 81	01 93 83 81	01 93 84 81	01 93 85 81	01 93 86 81	01 93 87 81	01 93 88 81	01 93 93 81	01 93 93 81	01 93 93 81	01 93 93 81	01 93 93 81	01 93 93 81	01 93 93 81	01 93 93 81
IN 20	01 94 81	01 94 82 81	01 94 83 81	01 94 84 81	01 94 85 81	01 94 86 81	01 94 87 81	01 94 88 81	01 94 94 81	01 94 94 81	01 94 94 81	01 94 94 81	01 94 94 81	01 94 94 81	01 94 94 81	01 94 94 81
IN 21	01 95 81	01 95 82 81	01 95 83 81	01 95 84 81	01 95 85 81	01 95 86 81	01 95 87 81	01 95 88 81	01 95 95 81	01 95 95 81	01 95 95 81	01 95 95 81	01 95 95 81	01 95 95 81	01 95 95 81	01 95 95 81
IN 22	01 96 81	01 96 82 81	01 96 83 81	01 96 84 81	01 96 85 81	01 96 86 81	01 96 87 81	01 96 88 81	01 96 96 81	01 96 96 81	01 96 96 81	01 96 96 81	01 96 96 81	01 96 96 81	01 96 96 81	01 96 96 81
IN 23	01 97 81	01 97 82 81	01 97 83 81	01 97 84 81	01 97 85 81	01 97 86 81	01 97 87 81	01 97 88 81	01 97 97 81	01 97 97 81	01 97 97 81	01 97 97 81	01 97 97 81	01 97 97 81	01 97 97 81	01 97 97 81

	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15	OUT 16
IN 24	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 25	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 26	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 27	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 28	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 29	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 30	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 31	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 32	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0
	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81

[Table 12](#) lists the hex codes for switching inputs 1 to 32 to outputs 17 to 32.

Table 12: Hex Table (IN 1-32 to OUT 17-32)

	OUT 17	OUT 18	OUT 19	OUT 20	OUT 21	OUT 22	OUT 23	OUT 24	OUT 25	OUT 26	OUT 27	OUT 28	OUT 29	OUT 30	OUT 31	OUT 32
IN 1	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 2	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 3	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 4	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 5	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 6	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81

Communication Protocols

	OUT 17	OUT 18	OUT 19	OUT 20	OUT 21	OUT 22	OUT 23	OUT 24	OUT 25	OUT 26	OUT 27	OUT 28	OUT 29	OUT 30	OUT 31	OUT 32
IN 7	01 87 91 81	01 87 92 81	01 87 93 81	01 87 94 81	01 87 95 81	01 87 96 81	01 87 97 81	01 87 98 81	01 87 99 81	01 87 9A 81	01 87 9B 81	01 87 9C 81	01 87 9D 81	01 87 9E 81	01 87 9F 81	01 87 A0 81
IN 8	01 88 91 81	01 88 92 81	01 88 93 81	01 88 94 81	01 88 95 81	01 88 96 81	01 88 97 81	01 88 98 81	01 88 99 81	01 88 9A 81	01 88 9B 81	01 88 9C 81	01 88 9D 81	01 88 9E 81	01 88 9F 81	01 88 A0 81
IN 9	01 89 91 81	01 89 92 81	01 89 93 81	01 89 94 81	01 89 95 81	01 89 96 81	01 89 97 81	01 89 98 81	01 89 99 81	01 89 9A 81	01 89 9B 81	01 89 9C 81	01 89 9D 81	01 89 9E 81	01 89 9F 81	01 89 A0 81
IN 10	01 8A 91 81	01 8A 92 81	01 8A 93 81	01 8A 94 81	01 8A 95 81	01 8A 96 81	01 8A 97 81	01 8A 98 81	01 8A 99 81	01 8A 9A 81	01 8A 9B 81	01 8A 9C 81	01 8A 9D 81	01 8A 9E 81	01 8A 9F 81	01 8A A0 81
IN 11	01 8B 91 81	01 8B 92 81	01 8B 93 81	01 8B 94 81	01 8B 95 81	01 8B 96 81	01 8B 97 81	01 8B 98 81	01 8B 99 81	01 8B 9A 81	01 8B 9B 81	01 8B 9C 81	01 8B 9D 81	01 8B 9E 81	01 8B 9F 81	01 8B A0 81
IN 12	01 8C 91 81	01 8C 92 81	01 8C 93 81	01 8C 94 81	01 8C 95 81	01 8C 96 81	01 8C 97 81	01 8C 98 81	01 8C 99 81	01 8C 9A 81	01 8C 9B 81	01 8C 9C 81	01 8C 9D 81	01 8C 9E 81	01 8C 9F 81	01 8C A0 81
IN 13	01 8D 91 81	01 8D 92 81	01 8D 93 81	01 8D 94 81	01 8D 95 81	01 8D 96 81	01 8D 97 81	01 8D 98 81	01 8D 99 81	01 8D 9A 81	01 8D 9B 81	01 8D 9C 81	01 8D 9D 81	01 8D 9E 81	01 8D 9F 81	01 8D A0 81
IN 14	01 8E 91 81	01 8E 92 81	01 8E 93 81	01 8E 94 81	01 8E 95 81	01 8E 96 81	01 8E 97 81	01 8E 98 81	01 8E 99 81	01 8E 9A 81	01 8E 9B 81	01 8E 9C 81	01 8E 9D 81	01 8E 9E 81	01 8E 9F 81	01 8E A0 81
IN 15	01 8F 91 81	01 8F 92 81	01 8F 93 81	01 8F 94 81	01 8F 95 81	01 8F 96 81	01 8F 97 81	01 8F 98 81	01 8F 99 81	01 8F 9A 81	01 8F 9B 81	01 8F 9C 81	01 8F 9D 81	01 8F 9E 81	01 8F 9F 81	01 8F A0 81
IN 16	01 90 91 81	01 90 92 81	01 90 93 81	01 90 94 81	01 90 95 81	01 90 96 81	01 90 97 81	01 90 98 81	01 90 99 81	01 90 9A 81	01 90 9B 81	01 90 9C 81	01 90 9D 81	01 90 9E 81	01 90 9F 81	01 90 A0 81
IN 17	01 91 91 81	01 91 92 81	01 91 93 81	01 91 94 81	01 91 95 81	01 91 96 81	01 91 97 81	01 91 98 81	01 91 99 81	01 91 9A 81	01 91 9B 81	01 91 9C 81	01 91 9D 81	01 91 9E 81	01 91 9F 81	01 91 A0 81
IN 18	01 92 91 81	01 92 92 81	01 92 93 81	01 92 94 81	01 92 95 81	01 92 96 81	01 92 97 81	01 92 98 81	01 92 99 81	01 92 9A 81	01 92 9B 81	01 92 9C 81	01 92 9D 81	01 92 9E 81	01 92 9F 81	01 92 A0 81
IN 19	01 93 91 81	01 93 92 81	01 93 93 81	01 93 94 81	01 93 95 81	01 93 96 81	01 93 97 81	01 93 98 81	01 93 99 81	01 93 9A 81	01 93 9B 81	01 93 9C 81	01 93 9D 81	01 93 9E 81	01 93 9F 81	01 93 A0 81
IN 20	01 94 91 81	01 94 92 81	01 94 93 81	01 94 94 81	01 94 95 81	01 94 96 81	01 94 97 81	01 94 98 81	01 94 99 81	01 94 9A 81	01 94 9B 81	01 94 9C 81	01 94 9D 81	01 94 9E 81	01 94 9F 81	01 94 A0 81
IN 21	01 95 91 81	01 95 92 81	01 95 93 81	01 95 94 81	01 95 95 81	01 95 96 81	01 95 97 81	01 95 98 81	01 95 99 81	01 95 9A 81	01 95 9B 81	01 95 9C 81	01 95 9D 81	01 95 9E 81	01 95 9F 81	01 95 A0 81
IN 22	01 96 91 81	01 96 92 81	01 96 93 81	01 96 94 81	01 96 95 81	01 96 96 81	01 96 97 81	01 96 98 81	01 96 99 81	01 96 9A 81	01 96 9B 81	01 96 9C 81	01 96 9D 81	01 96 9E 81	01 96 9F 81	01 96 A0 81
IN 23	01 97 91 81	01 97 92 81	01 97 93 81	01 97 94 81	01 97 95 81	01 97 96 81	01 97 97 81	01 97 98 81	01 97 99 81	01 97 9A 81	01 97 9B 81	01 97 9C 81	01 97 9D 81	01 97 9E 81	01 97 9F 81	01 97 A0 81

Communication Protocols

	OUT 17	OUT 18	OUT 19	OUT 20	OUT 21	OUT 22	OUT 23	OUT 24	OUT 25	OUT 26	OUT 27	OUT 28	OUT 29	OUT 30	OUT 31	OUT 32
IN 24	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 25	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 26	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 27	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B	9B
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 28	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C	9C
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 29	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D	9D
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 30	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E	9E
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 31	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F	9F
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
IN 32	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01	01
	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0	A0
	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81

LIMITED WARRANTY

We warrant this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by us or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
 - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
 - ii) Product modification, or failure to follow instructions supplied with the product
 - iii) Repair or attempted repair by anyone not authorized by Kramer
 - iv) Any shipment of the product (claims must be presented to the carrier)
 - v) Removal or installation of the product
 - vi) Any other cause, which does not relate to a product defect
 - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC* Rules and Regulations:
Part 15: "Radio frequency devices
Subpart B Unintentional radiators"

CAUTION!

■ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.

■ Use the supplied DC power supply to feed power to the machine.

■ Please use recommended interconnection cables to connect the machine to other components.

* FCC and CE approved using STP cable (for twisted pair products)



**For the latest information on our products and a list of
Kramer distributors visit www.kramerelectronics.com
where updates to this user manual may be found.
We welcome your questions, comments and feedback.**



Caution

Safety Warning:

Disconnect the unit from the power supply
before opening/servicing.



PN: 2900-300014



Rev: 2